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ABSTRACT

On December 12, 1985, a charter airline carrying 248 United States soldiers crashed and burned after a refueling stop in Gander, Newfoundland, killing all on board. After the crash, family assistance workers were appointed to help the surviving family members of each dead soldier. This study attempted to: (1) identify the major areas of stress for disaster family assistance workers; (2) examine the relation between exposure to these stressors and health; and (3) locate risk factors, or resistance resources that might moderate ill effects of exposure. A survey instrument assessed duration and intensity of family helping activities, illness indicators, psychiatric symptoms, psychological well-being, and social and personality variables at 6 months after the crash and again at the 1-year point for 131 family assistance officers. The results indicated a dose-response effect between exposure measured at Time 1 and illness levels at Time 2, an increase in symptoms, and a change in psychological well-being over time. Social support was a moderator of the exposure-symptoms relation, and both social support and personality hardiness were moderators with respect to Time 2 illness and change in psychological well-being. Other evidence suggests that prior experience with death and grief, and having volunteered for the family helper role also reduced the risk of developing ill effects. (Author/NB)

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THE IMPACT OF A MILITARY AIR DISASTER ON THE HEALTH OF FAMILY ASSISTANCE WORKERS *

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ABSTRACT

The worst peacetime disaster in U.S. Army history occurred on December 12, 1985 in Gander, Newfoundland. A charter airline carrying 248 soldiers back from middle-east peacekeeping duties crashed and burned after a refueling stop, killing all on board. After the crash, family assistance workers were appointed to help the surviving family members of each dead soldier. While much attention has been paid to the impact of such disasters on survivors and bereaved relatives, little is known about the health risks to those who perform helper roles. The present study aimed to (1) identify the major areas of stress for disaster family assistance workers, (2) examine the relation between exposure to these stressors and health, and (3) locate risk-factors, or resistance resources that might moderate any ill-effects of exposure. A survey instrument assessed duration and intensity of family helping activities, illness indicators, psychiatric symptoms, psychological well-being, and social and personality variables at 6-months after the crash, and again at the 1-year point for 131 family assistance officers. Results indicate a dose-response effect between exposure measured at Time 1 and illness levels at Time 2, increase in symptoms, and change in psychological well-being over time. ANOVA results identify social support (of family, friends, and work supervisors) as a moderator of the exposure - symptoms relation, and both social support and personality hardiness as moderators with respect to time 2 illness and change in psychological well-being. Other evidence suggests prior experience with death and grief, and having volunteered for the family helper role also reduced the risk of developing ill-effects.

THE IMPACT OF A MILITARY AIR DISASTER ON TH HEALTH OF FAMILY ASSISTANCE WORKERS

The chartered Army jetliner that crashed in Gander, Newfoundland in 1985 killed all 248 soldiers on board. This was one of three flights carrying U.S. soldiers home for Christmas after 6 months of peacekeeping duty in the Sinai. All were from Fort Campbell, Kentucky, where they had lived and worked together for 18 months or more. Besides those killed, many others were affected by this sudden, unexpected disaster. Wives and parents of the dead, crash site workers, morgue personnel, survivors in the affected military units, and the entire Fort Campbell community were all stricken.

A substantial literature on human reactions to disasters has accumulated over the years, with researchers usually focusing on the immediate or primary disaster victims (e.g., Cobb & Lindemann, 1943; Wallace, 1956; Lifton, 1968; Titchener & Kapp, 1976). These are victims whose suffering is most immediate and noticeable, such as the seriously injured, the homeless and displaced, and the bereaved relatives of the dead. In recent years, more research is being directed toward the effects of disasters on rescue workers and helpers. Most of these studies have focused on body handlers and morgue workers (e.g., Hershiser & Quarantelli, 1976; Taylor, 1984; Jones, 1985), and on search and rescue personnel (e.g., Taylor & Frazer, 1982; McFarlane & Raphael, 1984; Durham, McCammon, & Allison, 1985). But with rare exception, investigators have ignored disaster workers whose role it is to provide practical assistance and emotional support to bereaved family members.

Given the findings of the few studies that have been done, this neglect s ems little justified. In the af ermath of the Granville train disaster of 1977, Raphael et. al. (1983-84) observed increased role confusion and associated feelings of depression and helplessness in workers whose principal function was to provide emotional support to bereaved family members. Berah et. al. (1984) found that, after the Ash Wednesday fires, intense and intimate involvements between helpers and victims led to increased muscle tension, fatigue, and sleep disturbances, especially for those providing emotional support and counseling. And, in a recently reported study of rescue workers in the Dallas-Ft. Worth Delta crash, Keating et. al. (1987) reported that those who worked primarily with families of victims had higher scores on symptomatology than any other group considered.

In the Gander disaster, survivor assistance officers (SAO's) were assigned to care for the families of the dead at Fort Campbell and elsewhere. One assistance worker was assigned for each bereaved family. The role of the family assistance officer is somewhat ambiguously defined; it includes everything from helping to arrange the funeral to providing a sympathetic ear, and even a shoulder to cry on. The general guidance provided these officers is to "assist the family in any way possible." They are expected to help grieving relatives negotiate the Army's sometimes maze-like bureaucracies to obtain information and insurance benefits, and to assure that the remains, belongings, and affairs of the deceased are properly tended to. Ordinarily, the family assistance worker ends his involvement with the family once the funeral is over and all appropriate family benefits have been arranged. But in the Gander disaster the period

of contact between officer and family was usually several months in duration. This was due in part to the difficult body recovery and identification process. In many cases it was weeks before the body was positively identified, greatly extending the period of contact between family members and assistance officers.

This tragic set of circumstances nonetheless provided a rare opportunity to learn about the role of family helpers in disasters, and the possible health consequences to these support providers. All family assistance workers involved in the Gander disaster were active duty Army officers, making them more accessible to study than their civilian counterparts might be. Furthermore, in civilian disasters there is usually no organized support network for bereaved families, making it difficult for researchers to locate appropriate study populations. This paper examines the Gander family assistance officers, with three aims:

1. To understand the role of family helpers in a mass tragedy, and identify the major sources of stress
2. To examine the impact of this stressful experience on the health and psychological well-being of family helpers
3. To identify the risk factors, or resistance resources that might moderate this relation

METHOD

Six months after the crash, a survey instrument was mailed to all Gander family assistance officers for whom addresses were available (N=191). A total of 164 responded, or 86%. Modal response time was 2 weeks, and the median was 7 weeks. Many reported having waited to complete the survey, because they were still engaged in SAO duties at the time. A follow-up survey was mailed to all Time 1 respondents one-year after the crash. There were 131 Time 2 respondents, or 80%. Modal response time was again 2 weeks, with a median of 4 weeks.

In a series of closed and open-ended questions, family assistance workers described themselves, the people they helped, and their experiences. A measure of exposure or stress at Time 1 was constructed that primarily reflected duration and intensity of contact with surviving family members. Exposure included number of days the individual functioned as an assistance officer, number of contacts with surviving family member(s), number of family members actually assisted, amount of time taken away from normal duties, time taken away from one's own family, whether or not the officer attended the funeral of the deceased, and whether the assistance officer also had responsibility for the handling of the victim's personal effects.

Self-report data on recent illnesses, sick call visits, and psychiatric symptoms were obtained at both time points. A 20-item symptoms checklist was employed, drawing items from the Hopkins Symptoms Checklist (Derogatis et. al., 1974) that reflected problems commonly reported in the aftermath of traumatic stress (Weisaeth & Sund, 1982; Raphael, 1986). Responses were summed to create a total

symptoms score for each time point. An illness index included number of doctor visits over the previous 6-months, number of work days lost because of illness, and a one-item descriptor of general health. A slightly modified version of the Bradburn Psychological Well-Being scale (Wetzler, Ursano, & Creuss, 1983) was included to measure positive and negative affect states.

The Time 2 survey included a modified version of Kobasa's (1979) measure of personality hardiness. This 45-item scale (Bartone, 1984) assesses the three dimensions of commitment (to self, others, work, life), control (sense of control over one's own destiny), and challenge (belief that change represents opportunity for growth, rather than threat). An expanded version of Kobasa's (1982) "regressive coping" scale was also included in the Time 2 survey. This 25-item scale includes questions about positive or constructive ("transformational") coping behaviors, as well as negative, avoidance ("regressive") ones (Appendix 1). An index of received social support was constructed using information provided by the respondent on the reactions of family, friends, and commander to his/her assignment as family assistance officer, as well as the amount of useful and relevant information obtained through official organizational channels. The Berkman (1977) Index of Social Networks was also included as a measure of more general social supports.

RESULTS

Respondents ranged in age from 22 to 51, with a median of 34. The majority, 73%, were within the ages of 27 and 39. They were 93% male, 85% white, and 79% married. Ninety-four percent held at least a college degree. Most (51%) of the SAO's were Captains, followed by

Majors (31%), and Lieutenants (10%). Twenty-seven percent provided assistance to one family member, 25% helped two, 25% three, and 19% assisted four family members. The most common situation was for a family assistance worker to help both parents of a dead son or daughter (48%), while 17% helped widows (some with children) and 15% helped mothers exclusively. Eleven percent of SAO's assisted two parents and a widow, and 4% helped a mother and a widow.

Content analysis of responses to the open-ended questions revealed 4 major areas of stress for the family assistance officers. First, many reported being unprepared to deal with the profound grief of widows and bereaved parents. Especially in the early and often awkward first meetings of helpers with family members, there were frequent open expressions of sorrow and anger. Assistance officers describe feeling sad, helpless, and disturbed by such encounters. Next, a one to two-week period of extreme confusion and disorder was commonly referred to as extremely trying. Factual information was scant early on, and communication was impeded by the physical remove of the crash site (Gander, Newfoundland), the morgue operations center (Dover A.F.B., Delaware), and the flight origination point (Egypt). It took over a day just to confirm the passenger list. Third, the lengthy body identification process was noted by family helpers as an especially trying aspect of the experience. In fact, it was 2 1/2 months before the final body was identified. There was little the family assistance officers could say or do during this period to comfort families anxiously awaiting news of their loved one. Finally, many family assistance officers described having difficulty dissociating themselves from the victim and family. A common experience was imagining oneself in the place

of the deceased, often associated with the desir to help out as much as possible. Many family helpers formed strong emotional ties with the families they assisted, making it difficult to disengage and return to normal activities when appropriate.

For the total group, the mean number of symptoms reported at Time 1 was 3.11 (out of 20 possible). The most commonly reported symptoms were: headaches (40%), feeling nervous or tense (33%), trouble sleeping (31%), general aches and pains (29%), common cold (25%), depressed mood (21%) and tired/lacking energy (20%). More than twice as many symptoms were reported at Time 2 (Mean=6.59). Most common were headaches (63%), common cold (59%), general aches and pains (56%), feeling nervous or tense (52%), tired/lacking energy (51%), trouble sleeping (49%), difficulty concentrating (49%), upset stomach (45%), and depressed mood (40%). Matched-pairs t-tests revealed significant increases in all but 1 symptom out of 20, taking medication to relax/sleep. These results are summarized in Table 1.

Analysis of variance procedures were used to examine the effects of exposure on psychological well-being, psychiatric symptoms, and illness, as well as to identify any moderating effects of social support or personality hardiness. Respondents who completed both surveys (N=131) were divided into three groups based upon exposure to bereaved family helper stress: high exposure (upper quartile of distribution), medium exposure (middle 50% of distribution), and low exposure (lower quartile of distribution). Next, analyses of covariance were performed on the three Time 2 outcome variables of psychological well-being, psychiatric symptoms,

and illness, entering as a covariate in each case the corresponding Time 1 health measure. For example, the analysis on Time 2 psychological well-being controlled for Time 1 levels by entering Time 1 psychological well-being as a covariate.

TABLE 1: Means and Matched-Pairs Differences for Symptoms over Time

SYMPTOM	N	T1	T2	Matched-Pairs Difference	T
1. Common cold	122	.246	.591	.336	5.94***
2. Dizziness	121	.049	.153	.107	2.79**
3. Aches and Pains	122	.287	.561	.279	5.46***
4. Hands Sweating	121	.107	.220	.107	2.79**
5. Headaches	122	.402	.629	.238	4.95***
6. Muscle Twitches	122	.139	.295	.139	3.16**
7. Nervous or Tense	122	.328	.523	.189	3.89***
8. Rapid Heart Beat	121	.059	.212	.157	4.23***
9. Shortness of Breath	121	.066	.167	.311	3.80***
10. Skin Rashes	121	.091	.182	.074	2.09*
11. Upset Stomach	122	.188	.447	.254	5.72***
12. Trouble Sleeping	121	.314	.485	.174	3.86***
13. Depressed Mood	121	.215	.402	.182	3.87***
14. Trouble Concentrating	121	.182	.485	.289	5.74***
15. Crying Easily	122	.041	.121	.074	2.55*
16. Loss of Appetite	122	.066	.182	.115	2.95**
17. Medic. to Relax/Sleep	122	.033	.054	.016	1.00
18. Tired/Lack of Energy	121	.198	.508	.306	5.85***
19. Gen. Loss of Interest	122	.074	.242	.164	4.38***
20. Life is Meaningless	120	.033	.144	.100	3.11**

* = $p < .05$
** = $p < .01$
*** = $p < .001$

Results for overall psychological well-being show a clear dose response effect, with well-being diminishing as a function of higher exposure (Figure 1). This effect is most pronounced for family assistance workers who are low in personality hardiness or social support and high in exposure. High support and high hardiness groups show almost no change in psychological well-being from medium to high exposure conditions. Family helpers high in hardiness are also highest in psychological well-being across all three exposure levels, and those low in hardiness are likewise lowest in well-being. Though not displayed in Figure 1, it is illustrative to look at the combined effects of hardiness and social support. High exposure family helpers who were low both in hardiness and social support were by far the lowest in Time 2 psychological well-being (-14.2), while those high in both these resources and under low exposure were highest in well-being (6.0). Under high exposure, those high in both resources seemed well-protected, with moderate positive scores on well-being (2.7). These results suggest an additive effect for both social support and hardiness on psychological well-being, at least at low and medium exposure levels. At high exposure levels, there appears to be a buffering influence; those high in either hardiness or social support show no further decline in psychological well-being, while those low in either resource drop dramatically.

Work by Bradburn (1969) and others has suggested that psychological well-being is not a unified construct, but is composed of two elements that may be independent in some respects. The "negative affect" component has been shown to correlate strongly

FIGURE 1: TIME 2 PSYCH. WELL-BEING FOR VARIOUS EXPOSURE GROUPS

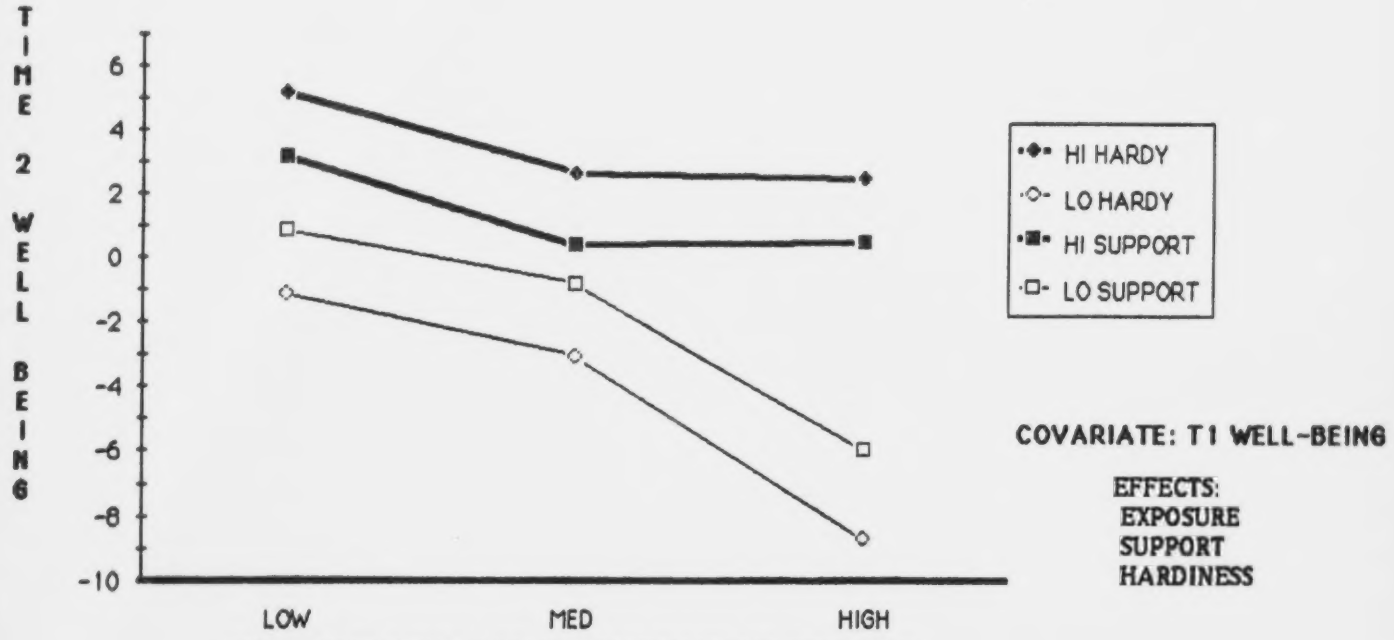


FIGURE 1a: TIME 2 POS. WELL-BEING FOR VARIOUS EXPOSURE GROUPS

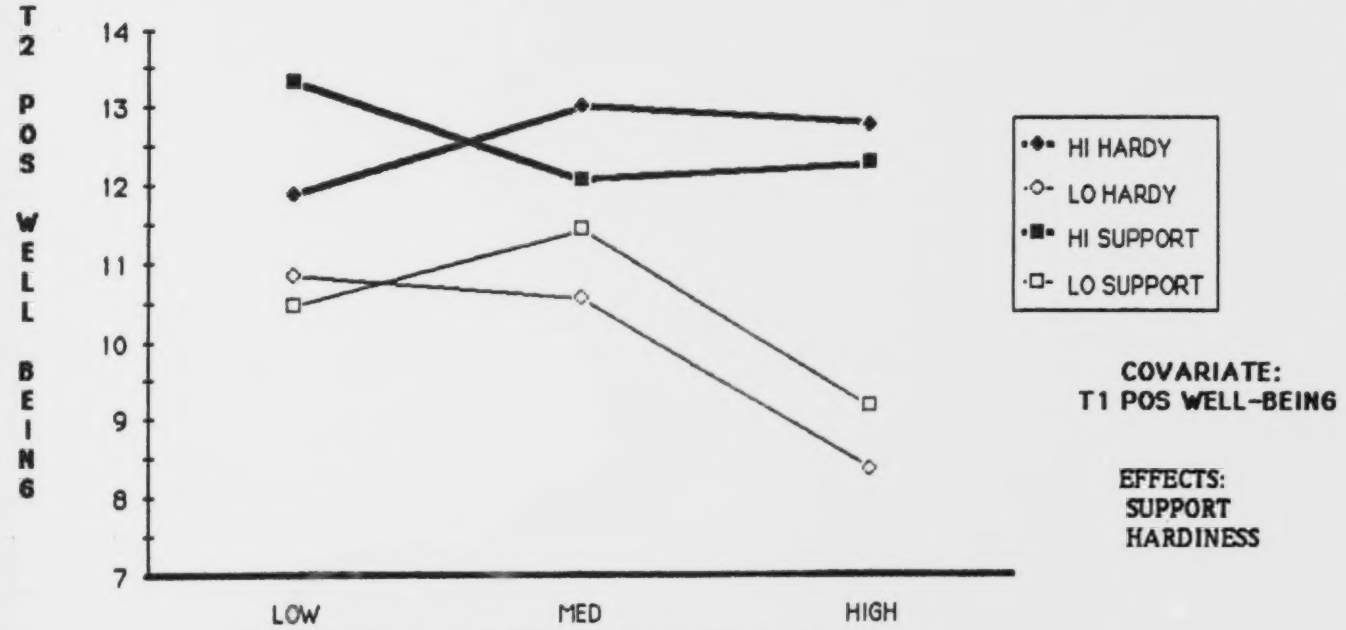
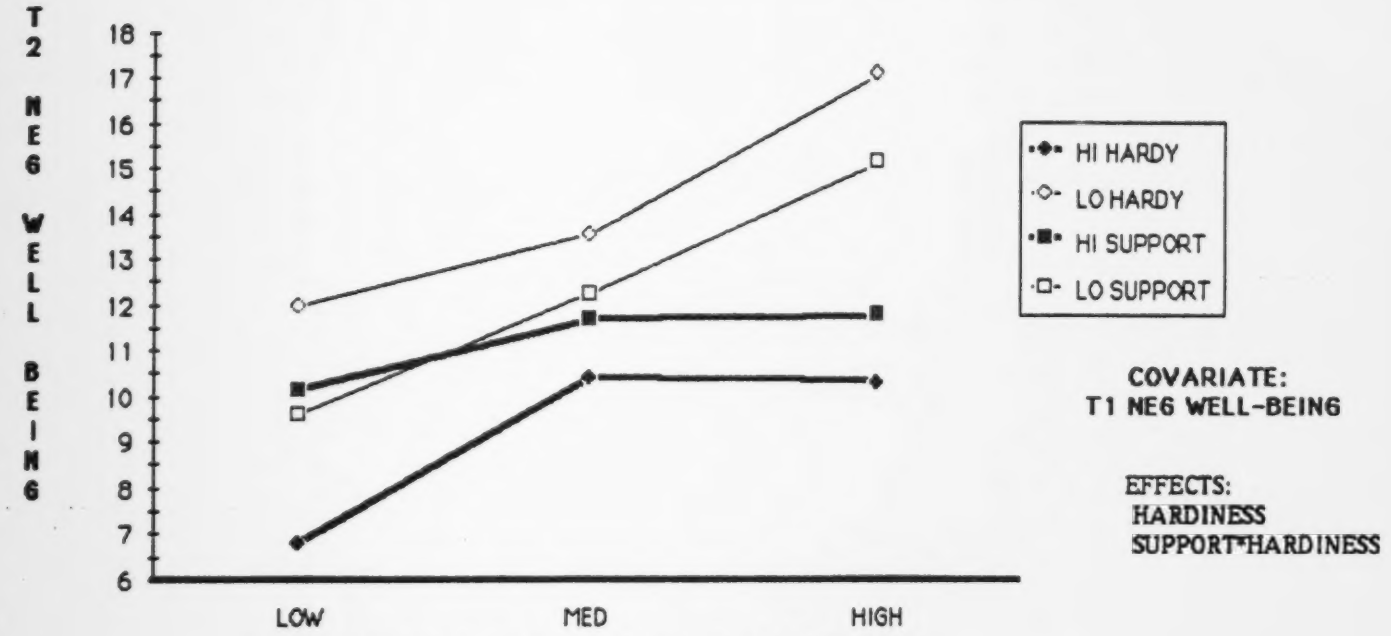


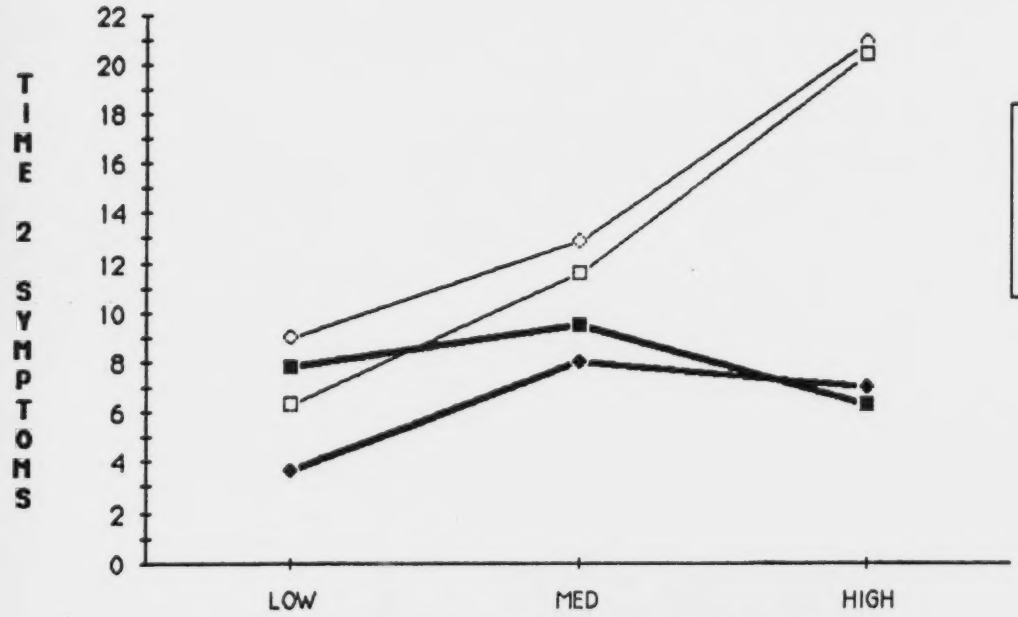
FIGURE 1b: TIME 2 NEG. WELL-BEING FOR VARIOUS EXPOSURE GROUPS



with various measures of anxiety, neurotic tendencies, and psychic impairment. "P sitive affect" seems more rela ed to a sense of control over one's environment and oneself, success in the pursuit of goals, and ego strength. To explore the possible differential effects of exposure on positive and negative well-being, these dimensions were examined separately in analyses similar to that for total well-being (figures 1a and 1b). Generally, effects are quite similar to those for total well-being. Both hardiness and support seem to function additively with exposure from low to medium levels, with possible buffering effects occuring at high exposure levels. It is interesting that, while all groups either increased or stayed the same in negative affect with higher exposure, increased exposure was associated with enhanced positive affect for two groups. Those high in hardiness are higher in positive affect at medium exposure levels, and tend to maintain this position even at high exposure. Those low in social support also increase at medium exposure, but drop rather low in positive affect at high exposure levels. These results indicate that some individuals increase in both positive and negative affect under increasingly stressful conditions.

The next analysis examined the effects of exposure, social support, and hardiness on Time 2 psychiatric symptoms, with Time 1 symptoms controlled for. Main effects were seen for exposure, support, and hardiness, and an interaction between exposure and support (Figure 2). Again, both hardiness and social support appear to have additive effects with exposure at low and medium levels, and buffering effects at high exposure. Family helpers who are low in either personality hardiness or social support have dramatically higher symptoms scores than other groups, while those high in either

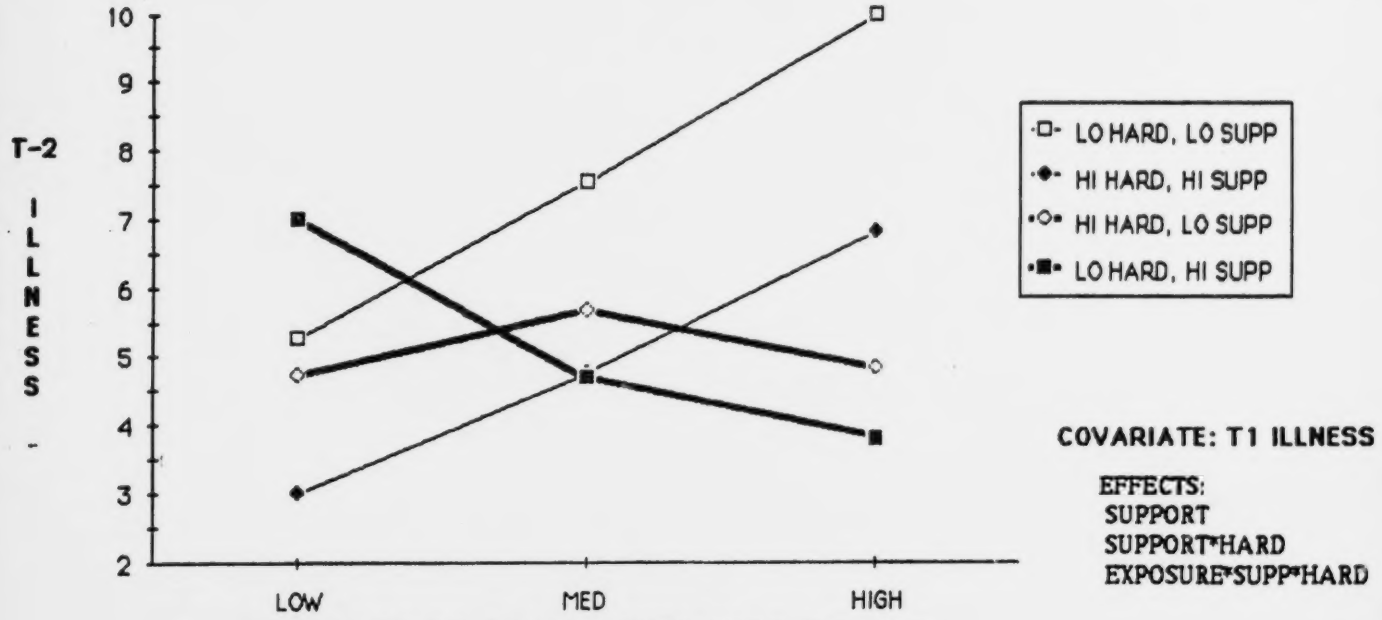
FIGURE 2: TIME 2 SYMPTOMS FOR VARIOUS EXPOSURE GROUPS



COVARIATE: T1 SYMPTOMS

EFFECTS:
EXPOSURE
SUPPORT
HARDINESS
EXPOSURE*SUPPORT

FIGURE 3: ILLNESS AT TIME 2 FOR VARIOUS EXPOSURE GROUPS



resour e report rather few symptoms des ite high exposure.

The final analysis examined reported illness at Time 2, again controlling for Time 1 levels (Figure 3). A significant 3-way interaction effect was found for exposure*support*hardiness, a 2-way interaction for support*hardiness, and a main effect for social support. Family helpers who are low in both hardiness and social support report more illness than those high in these resources, and both groups show linear increases with exposure. Those high in hardiness but low in support show rather steady illness levels across exposure categories. Family helpers high in support but low in hardiness report less illness at higher exposure.

DISCUSSION

These results clearly indicate that family assistance workers who provide support to bereaved families of disaster victims are at risk for increased illness, psychiatric symptoms, and negative psychological well-being for up to a year after the event. In the Gander disaster, there was an unusually long period of contact between helpers and families, averaging about 5 1/2 months. Providing practical and emotional assistance to grieving families under circumstances such as these is evidently a most difficult challenge. Family assistance workers in this study described as especially trying the initial period of disruption and disorder, the long body identification effort, seeing oneself in the place of the dead, and a sense of being powerless to help the dead and grieving. Data collected at the 6-month point show some early ill-effects of this experience. While data on a suitable comparison group were not

available, a dose-response curve was apparent even at Time 1, wher degree of exposure to bereaved family members correlated with psychiatric symptoms, doctor visits, recent illnesses, and with lower psychological well-being.

More importantly, the one year follow-up revealed even more serious negative health consequences. The data are quite clear: there is often a price to pay for providing support to families of disaster victims, and the impact may be felt long after the event itself. It is not clear whether this is attributable to the unusual aspects of this helper role, or to the chronic nature of the stressor(s). Most likely, it is some combination of both. Not only is the bereaved family helper role a very taxing one but, unlike the role of the typical rescue worker, it is one that can persist for a very long time. Such was certainly the case in the Gander disaster. In some respects, this may be akin to the chronic stress of living near a nuclear or chemical disaster site, such as Three Mile Island or Love Canal. Other investigators have documented the harmful psychological effects of this kind of long-term exposure (cf. Bromet & Schulberg, 1986; Baum, Gatchel, & Schaeffer, 1983; Fowlkes & Miller, 1982).

Providing assistance and emotional support to bereaved family members certainly involves a different kind of tension than living near a nuclear accident site. Raphael (1986) has summarized research suggesting there are three sources of extreme stress for helpers in disasters: (1) the close encounter with death, which reminds helpers of their own vulnerability, (2) sharing the anguish of victims and families, and the close empathic identification that often results,

and (3) role ambiguity and conflict. Our data indicate that all three sources of stress were operative for the Gander family assistance officers. Role issues were especially troublesome. The role itself is not clearly defined by the sponsoring organization, leaving many helpers to define it for themselves. Also, providing emotional support to grieving relatives is an extremely unfamiliar role for most family assistance officers, in contrast to Army chaplains for example. And finally, the demands of the normal work load continue unabated in most cases. Gander family assistance officers were often in conflict as to how to allocate their time, feeling pressured to meet their normal work responsibilities, and yet desiring to assist and comfort the families of the crash victims.

Perhaps the more important findings of this study are those that implicate social support and personality hardiness as moderators or buffers of the deleterious impact of disaster helper stress. Many studies have found social and personality variables can moderate various kinds of stress, but there have been few clues as to how this might happen. In this study, the support of family, friends, and work supervisors (commanders), especially with respect to the family assistant role, provided an important resource for some family assistance officers. Particularly at high exposure or stress levels, having this kind of support seemed to protect individuals from related psychological and physical morbidity. Perhaps this is because it served to diminish role conflict and confusion.

The personality characteristics of hardiness seemed to confer even more protection than social support. Individuals high in hardiness may adjust more readily to the chaos and confusion of

disaster situations, and be more apt to perceive challenges and opportunities for growth where others see threat and disruption. Disaster helpers with a characteristic "hardy" world view are also more likely to see their assistance activities as highly meaningful, and be more committed to the role. Additionally, they are perhaps better at stepping into and making sense of ambiguously defined roles, drawing upon a personal sense of control to formulate their own definitions and act accordingly. Supportive commanders who trust subordinates enough to empower them to make their own decisions probably reinforce such healthy attitudes and behaviors, and may even foster them. An important question for future research concerns to what extent hardiness is a stable personality dimension, and to what extent it is situationally determined or influenced.

This study has demonstrated long-term negative health consequences in a large group of helpers of bereaved families after a major air disaster. Perhaps more importantly, it has shown social support and personality variables to be operative in accounting for individual differences in responses. Generally, those high in social support and hardiness remain healthy under prolonged family helper stress, while those low in these resources are most at risk for illness. Disasters will continue to occur, and people will continue to respond as helpers to unlucky victims. It is urgent that we develop a better understanding of the factors that can protect disaster workers from the negative psychological consequences of their sacrifice.

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Appendix 2: Symptoms Index

Following is a list of various troubles or complaints people sometimes have. Please indicate whether or not you experienced any of these over the past few weeks, by CIRCLING the appropriate number:

	None	A Little	Often	Very Often
	0	1	2	3
1. Common cold or flu				
2. Dizziness				
3. General aches and pains				
4. Hands sweat and feel damp anc clammy				
5. Headaches				
6. Muscle twitches or trembling				
7. Nervous or tense				
8. Rapid heart beat (not exercising)				
9. Shortness of breath (not exercising)				
10. Skin rashes				
11. Upset stomach				
12. Trouble sleeping				
13. Depressed mood				
14. Difficulty concentrating				
15. Crying easily				
16. Lack of appetite/loss of weight				
17. Taking medication to sleep or calm down				
18. Overly tired/lack of energy				
19. Loss of interest in TV, movies, news, friends				
20. Feeling life is pointless, meaningless				
21. Disturbing or upsetting dreams				
22. Jumpy, easily startled by sudden noises				
23. Feeling guilty for no good reason				

Appendix 1: Transformational/Regressive Coping Scale

Please ndicate to what extent the following s atements are true for you.

IN REACTING TO STRESSFUL EVENTS, I TEND TO:

	Never True 0	Sometimes True 1	Often True 2	Almost Always True 3
1. Get angry				
2. Smoke more				
3. Become apathetic, just don't care				
4. Take some time off from work				
5. Become more critical of myself				
6. Sleep more				
7. Look for entertainment/distraction				
8. Watch a lot of TV				
9. Drink more beer, wine, or liquor				
10. Take medication or drugs to relax				
11. Withdraw physically from situation				
12. Use some relaxation technique				
13. Feel guilty				
14. Eat more				
15. Just try to ignore it				
16. Change what's causing the stress				
17. Get help to change things				
18. See it as a challenge				
19. Seek information that will help				
20. Feel responsible for the outcome				
21. Decide what needs to be done				
22. Turn to religion, pray more				
23. Talk it out with someone				
24. Listen to music				
25. Rethink my goals and values				